

Boyana Norris

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Research Interests

Parallel and distributed computing, compiler technology, interactive supercomputing, object-oriented scientific computing, component software design.

Education

Southwest State University, Marshall, MN, Sep. 1991–Jan. 1993, 4.0/4.0 GPA.

Wake Forest University, Winston-Salem, NC, Aug. 1993–May 1995.
B.S. in Computer Science, May 1995, 3.95/4.0 GPA, Summa Cum Laude.

University of Illinois at Urbana-Champaign, Urbana, IL
Jan. 1993–May 1993: Research Experience for Undergraduates, 5.0/5.0 GPA.
Sept. 1995–Nov. 1999: Ph.D. in Computer Science, Jan. 2000, 3.71/4.0 GPA.
Thesis Title: “An Environment for Interactive Parallel Numerical Computing”
Thesis Advisor: Dr. Michael Heath

Work Experience

Undergraduate research assistant to Dr. Michael Heath, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign, Jan. 1993–May 1993. Developed and implemented a generalized parallel matrix multiplication algorithm using 2D data partitioning.

Consultant/Programmer, Information Technology Professionals, Winston-Salem, NC, Aug. 1993–May 1994. Business application development, mainly relational databases.

Software Developer, AMP, Inc., Winston-Salem, NC, summer 1994. MS Windows business application development.

Computer Center Consultant, Wake Forest University, Aug. 1994–May 1995. Applications support for university software.

Consultant/Programmer, self-employed, Apr. 1994–May 1995. Business application development and consulting.

Consultant/Senior Programmer, Liberty Data Systems, Kernersville, NC, summer 1995. Network application development and consulting.

Graduate Research Assistant to Dr. Michael Heath, National Center for Supercomputing Applications, University of Illinois, June 1996–January 1999, August–November 1999. Design and

implementation of a user-friendly interactive parallel computing environment.

Wallace Givens Research Associate, Argonne National Laboratory, Summer 1998. Development of a differentiated version of PETSc using automatic differentiation tools and high-level algorithmic templates.

Teaching Assistant, University of Illinois at Urbana-Champaign, January–May, 1999. Teaching discussion sections in an introductory computer science course, exam and homework preparation and grading.

Postdoctoral Research Staff, Argonne National Laboratory, November 1999–present. ADIC development and maintenance; developing a distributed ADIC web application server; enabling some NEOS solvers to use ADIC for generating code computing the Jacobian; integrating AD technology with PETSc and TAO.

Honors

Member of the National Honor Society since Jan. 1991.

Presidential Scholarship, Southwest State University, Sep. 1991–Dec. 1993.

Carswell Distinguished Scholarship, Wake Forest University, Sep. 1994–May 1995.

Member of Phi Beta Kappa since Apr. 1995.

SURGE Graduate Fellowship, University of Illinois at Urbana-Champaign, Sep. 1995–present.

Professional Activities

Served on the organization committee for the High Performance Computing Workshop at the Computer Science Department, University of Illinois at Urbana-Champaign, January 15, 1999.

Member, SIAM, ACM, IEEE, IEEE Computer Society.

Member of the Common Component Architecture Forum.

Reviewer, IPDPS'2001.

Selected Publications

A. Radenski, A. Vann, and B. Norris. Parallel Probabilistic Computations on a Cluster of Workstations. ParCo 97, In *Proceedings of the International Conference on Parallel Computing*, Bonn, Germany, September 16–19, 1997.

P. Hovland, B. Norris, L. Roh, and B. Smith. Developing a Derivative-Enhanced Object-Oriented Toolkit for Scientific Computations. In *Object Oriented Methods for Interoperable Scientific and Engineering Computing: Proceedings of the 1998 SIAM Workshop*, SIAM, Philadelphia, 1999.

A. Radenski, A. Vann, and B. Norris. Development and Utilization of Parallel Generic Algorithms for Scientific Cluster Computations. In *Object Oriented Methods for Interoperable Scientific and Engineering Computing: Proceedings of the 1998 SIAM Workshop*, SIAM, Philadelphia, 1999.

- A. Radenski, A. Vann, B. Norris. Development and Utilization of Generic Algorithms for Scientific Computations. *ECOOP 98, Workshop on Parallel Object Oriented Scientific Computing*, Brussels, Belgium, July 20-24, 1998. 2-page summary in *Object Oriented Technology*, Volume 1543 of *Lecture Notes in Computer Science*, Springer, 1998, pp. 464-465.
- A. Radenski, A. Vann, and B. Norris. Parallel Probabilistic Computations on a Cluster of Workstations. In *Parallel Computing: Fundamentals, Applications, and New Directions*, Elsevier, New York, 1998.
- A. Radenski, B. Norris, and W. Chenn. A Generic All-Pairs Cluster Computing Pipeline and Its Applications. In *Parallel Computing: Fundamentals & Applications*, Proceedings of the International Conference ParCo99, TU Delft, The Netherlands, Imperial College Press, 2000, pp. 367-374.
- J. Abate, S. Benson, L. Grignon, P. Hovland, L. McInnes, and B. Norris. Integrating automatic differentiation with object-oriented toolkits for high-performance scientific computing. Technical Report ANL/MCS-P820-0500, Mathematics and Computer Science Division, Argonne National Laboratory, 2000. Accepted for publication in Proceedings of AD2000.
- B. Norris and P. Hovland. A Distributed Application Server for Automatic Differentiation. Technical Report ANL/MCS-P856-1100, Mathematics and Computer Science Division, Argonne National Laboratory, 2000. Also in Proceedings of IPDPS2001 (CDROM).
- S. Benson, L. Freitag, P. Hovland, L. McInnes, B. Norris, M. Singer, and B. Smith. Software Components for PDEs and Optimization: Some Issues and Experiences. *SIAM Conference on Parallel Processing for Scientific Computing*, Portsmouth, Virginia, March 12-14, 2001.
- E. Dolan, P. Hovland, J. Moré, B. Norris, and B. Smith. Remote Access to Mathematical Software. *Internet Accessible Mathematical Computation Workshop 2001 at ISSAC'2001*, University of Western Ontario, Canada, 22 July, 2001.